

# GUJARAT TECHNOLOGICAL UNIVERSITY

## BE - SEMESTER-III EXAMINATION – SUMMER 2025

**Subject Code:3131302**

**Date:13-06-2025**

**Subject Name:Environmental Microbiology & Bioremediation**

**Time:02:30 PM TO 05:00 PM**

**Total Marks:70**

**Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

- Q.1** (a) Differentiate between animal cell & plant cell. **03**  
(b) Write a short note on Whittaker's five kingdom classification scheme. **04**  
(c) Explain the different parts of bacterial cell with neat diagram and also give the classification of bacteria. **07**
- Q.2** (a) Write the short note on phytoremediation. **03**  
(b) Differentiate between: prokaryotic cell & eukaryotic cell **04**  
(c) Explain the role of microbes in human life and in environment. **07**
- OR**
- (c) Explain the role of protozoa and algae for pollution control. **07**
- Q.3** (a) Define and explain (any three): (i) Magnification (ii) Numerical Aperture (iii) Resolution (iv) Reflective Index **03**  
(b) List out the various staining techniques and explain gram staining in detail. **04**  
(c) Enlist and explain the three types of tests to estimate the MPN of drinking water. **07**
- OR**
- Q.3** (a) Give the classification of microscopes. **03**  
(b) Describe the working of electron microscope with neat sketch. **04**  
(c) Explain the SPC test of milk using serial dilution techniques. **07**
- Q.4** (a) Differentiate between: Pasteurization & Lyophilization **03**  
(b) Enlist physical agents for the control of microbes and explain any one detail. **04**  
(c) What is pure culture? Explain a list of diff. techniques used for maintenance and preservation of pure culture. **07**
- OR**
- Q.4** (a) Differentiate between: Ionizing radiation and non-Ionizing radiation **03**  
(b) Enlist chemical agents for the control of microbes and explain any one detail. **04**  
(c) Describe the various cultural methods. **07**
- Q.5** (a) List out the major classes of industrial products & processes, in which micro-organisms are required. **03**  
(b) Explain the symptoms, treatment and prevention of any one disease caused by protozoa. **04**  
(c) Discuss the advantages and disadvantages of bioremediation. **07**
- OR**
- Q.5** (a) Write a short note on fermentation process. **03**  
(b) Explain the symptoms, treatment and prevention of any one disease caused by virus. **04**  
(c) Differentiate between (i) in-situ bioremediation & ex-situ bioremediation (ii) biodegradation and bioremediation **07**

\*\*\*\*\*